Claims

1. Nucleic acid coding for human semaphorin 6A-1 comprising:
   (a) the nucleotide sequence shown in SEQ ID NO:1,
   (b) a sequence corresponding to the nucleotide sequence shown in SEQ ID NO:1 within the degeneration of the genetic code, or
   (c) a sequence which hybridizes with the sequences of (a) or/and (b) under stringent conditions.

2. Nucleic acid coding for a binding domain of human semaphorin 6A-1 comprising:
   (a) the nucleotide sequence shown in SEQ ID NO:3,
   (b) a sequence corresponding to the nucleotide sequence shown in SEQ ID NO:3 within the degeneration of the genetic code, or
   (c) a sequence which hybridizes with the sequences of (a) or/and (b) under stringent conditions.

3. Nucleic acid according to claim 1 or 2, characterized in that it has a homology greater than 80% to the nucleotide sequence of SEQ ID NO:1 or SEQ ID NO:3.

4. Modified nucleic acid or nucleic acid analog having a nucleotide sequence according to claims 1-3, or a section having at least 12 bases therefrom.

5. A nucleic acid which encodes a protein having a semaphorin domain and which hybridizes under stringent conditions to a nucleic acid comprising the nucleotide sequence shown in SEQ ID NO:1.

6. Nucleic acid according to any of the preceding claims, which encodes a protein inhibiting neurite outgrowth.

7. Nucleic acid according to claim 6, which encodes a protein inhibiting neurite outgrowth of CNS-neuron.

8. Recombinant vector,
characterized in that it contains at least one copy of a nucleic acid according to claims 1-7, or a section therefrom.

9. Vector according to claim 8,
characterized in that it is a eukaryotic vector.

10. Cell,
characterized in that it is transformed with a nucleic acid according to any of claims 1-7 or with a vector according to claim 8 or 9.

11. Polypeptide encoded by a nucleic acid according to claims 1-7.

12. Polypeptide according to claim 11 being a fusion protein comprising a polypeptide encoded by a nucleic acid according to claims 1-7 and at least one further polypeptide.

13. Use of the polypeptide according to claim 11 or 12 or of fragments of said polypeptide as immunogen for the production of antibodies.

14. Antibodies against a polypeptide according to claim 11 or 12.

15. Pharmaceutical composition comprising:
(a) a nucleic acid according to any of claims 1-7,
(b) a recombinant vector according to claim 8 or 9,
(c) a cell according to claim 10,

(d) a polypeptide according to claim 11 or 12, or/and

(e) an antibody according to claim 14.

16. Use of a peptide according to claim 11 or 12 for the preparation of a pharmaceutical composition.

17. Use of a composition according to claim 15 as diagnostic agent.

18. Use of a composition according to claim 15 for the production of a therapeutic agent.

19. Use according to claim 18 for the modulation of the immune system.

20. Use according to any of claims 17-19 in gene therapy.

21. Use according to any of claims 17-20 for effecting differentiation, cytoskeletal stabilization and/or plasticity.

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